European MNE Subsidiaries' Embeddedness and Innovation Performance: Moderating Role of External Search Depth and Breadth

Ismail Gölgeci, Associate Professor, School of Business and Social Sciences, Department of Business Development and Technology, Aarhus University, Denmark. (Email: i.golgeci@btech.au.dk)
Alberto Ferraris, Senior Researcher, Department of Management, School of Management & Economics, University of Turin, Italy; Research Fellow of the Laboratory for International and Regional Economics, Graduate School of Economics and Management, Ural Federal University (Email: alberto.ferraris@unito.it).
Ahmad Arslan, Associate Professor (International Business), Department of Marketing, Management and International Business, Oulu Business School, University of Oulu, Finland. (Email: ahmad.arslan@oulu.fi)
Shlomo Y. Tarba, Professor, Department of Strategy & International Business, Birmingham Business School, University of Birmingham, United Kingdom (Email: s.tarba@bham.ac.uk)

Abstract

While much research has been conducted on the link between embeddedness and innovation outcomes, less attention has been paid on how and when MNE subsidiaries can effectively leverage their internal embeddedness to achieve greater innovation performance. We hypothesize knowledge transfer as a mediating mechanism to channel the potential role of MNE subsidiaries' internal embeddedness in innovation performance. Moreover, we explore the moderating influences of external search depth and breadth on subsidiaries' internal knowledge transfer and innovation performance. To test our framework, we rely on primary data collected from 91 subsidiaries of eleven European MNEs. The results show the degree of knowledge transfer from other MNE units mediates the link between subsidiaries' internal embeddedness and their innovation performance. We also find that external search depth positively moderates the link between the degree of knowledge transfer and subsidiary's innovation performance, while external search breadth does not. We illustrate that knowledge transfer mechanisms and the moderating role of external search approaches can be instrumental in channeling and effectively realizing the role of subsidiary internal embeddedness in innovation performance.

Keywords

Subsidiary embeddedness; external search depth; external search breadth; subsidiary innovation performance; knowledge transfer; relational embeddedness

1. Introduction

Knowledge transfer is of crucial importance for MNEs, because it allows them to exploit the strategic resources and capabilities across borders (Nadayama, 2018). Successful knowledge transfer across organizations is increasingly becoming essential for firms as more and more business markets are becoming data-driven. It has been estimated that firms that use data-driven insights based on successful knowledge transfer grow significantly faster than others (Bell, 2019). A good example in this concern is P.F. Chang which runs 300 Asian themed restaurants in 25 countries. It used streamlined knowledge transfer mechanisms to successfully offset the extra costs generated by an increase in the minimum wage in different markets (Bell, 2019). In a similar vein, the importance of knowledge from subsidiaries is highlighted in a recent Forbes article discussing Phillips and stressing the need for co-creation of value at the local level by knowledge transfer if such MNEs wish to be successful in the long run (Spits, 2019). Thus, the co-evolutionary processes in the subsidiaries of the MNCs with their global organizations and geographic locations receive growing scholarly attention (Phene & Tallman, 2018), and subsidiary embeddedness enhances the effects of the organizational and locational contexts on the scope of subsidiary new technology development.

In today's global economy, large firms' subsidiaries' internal embeddedness has become an essential focus of the extant research (e.g., Andersson, Björkman, & Forsgren, 2005; Bresciani & Ferraris, 2016; Ciabuschi, Holm, & Martín, 2014; Ferraris, 2014; Nell & Andersson, 2012). For example, Najafi-Tavani, Giroud, and Sinkovics (2012) concluded that willingness and socialization mechanisms are the most significant determinants of the extent of reverse knowledge transfer and underscored the significant association between socialization mechanisms and internal embeddedness. Likewise, Pu and Soh (2018) have recently examined how individual subsidiaries pursue various organizational learning processes and found that subsidiary competence is boosted by the knowledge resulting from

MNC networks whereas subsidiary scope hinges on the knowledge embedded in the host environments. Moreover, they stressed that organizational learning influences the way knowledge is adapted from the internal but not external embeddedness (Pu & Soh, 2018).

However, internal embeddedness does not ensure innovation performance on its own. Its influence on innovation does not follow a universal and straightforward pattern but entails intermediate means and contingencies. Knowledge transfer mechanisms and external search approaches can influence the way MNE subsidiaries' internal embeddedness translates into innovation performance (Ferraris, Santoro & Scuotto, 2018). In particular, external search approaches, which enrich firms' knowledge pool and helps them identify and leverage complementary external assets (Ren, Eisingerich, & Tsai, 2015), can play a pivotal role in circumstances under which internal relationships and knowledge transfer mechanisms can be effectively applied to foster innovation performance.

Connecting a variety of external knowledge resources to internal knowledge production is an essential strategy for many firms that prioritize innovation performance (Arvanitis & Woerter, 2009). Nevertheless, although a wealth of research has concentrated on internal (e.g., Ciabuschi, Dellestrand, & Martín, 2011; Ebers & Maurer, 2014; Hansen, 1999) and external (e.g., Breschi & Lissoni, 2001; Dahlander, O'mahony, & Gann, 2016; Faems, Van Looy, & Debackere, 2005; Ren et al., 2015) enablers of innovation, a fewer number of studies examined them jointly. Internal and external factors are complementary, and their role in innovation cannot be fully understood regardless of the other (Love, Roper, & Bryson, 2011). This further becomes compounded in multinational enterprises (MNEs), where subsidiaries are critical boundary-spanning agents for external knowledge search while also being embedded in MNEs' internal network (Kostova & Roth, 2003). Thus, the relevance of subsidiaries, which face such spatial and institutional duality, to innovation can become crucial for MNE success (Ferraris, Santoro, & Bresciani, 2017). However, there is still a lack of knowledge about the interplay

between subsidiaries' knowledge transfer mechanisms and external search processes in explaining MNE subsidiaries' innovation performance. Accordingly, further research is needed on how firms translate their relationships into subsidiary innovation performance, and under what boundary conditions, innovation-enabling mechanisms work better.

Our purpose is to investigate how MNE subsidiaries leverage their internal networks to enhance their innovation performance and how external search approaches moderate the way relational embeddedness leads to subsidiary innovation performance. In particular, we investigate how knowledge transfer procedures across European MNEs' business units and subsidiaries conveys the influence of subsidiaries' internal embeddedness within MNE network toward increased innovation performance and what role external search depth and breadth play in the effectiveness of such procedures. In so doing, we test our framework and draw conclusions using data gathered from 91 European MNE subsidiaries from 10 countries.

Our research contributes to strategy and innovation management literature in three salient ways. First, we tackle the role of subsidiaries' internal embeddedness in improving their innovation performance. An examination of internal relational forces reveals how internal embeddedness of MNE subsidiaries can be a source of innovation performance. This contribution adds to past research examining the interplay between subsidiaries' embeddedness and innovation outcomes (Ciabuschi et al., 2011; Dellestrand, 2011).

Second, our research details the linkage between embeddedness and innovation performance (Capaldo, 2007; Lincoln, Guillot, & Sargent, 2017) and expands debates on the role of internal knowledge transfer as a linking pin between internal relational resources and innovation outcomes. The role of knowledge transfer as a mediating mechanism underscores the importance of utilizing relational rents for innovation and signifies that resources MNE subsidiaries obtain from their internal networks can stay dormant if they are not acted upon. Therefore, we reveal that beyond the presence of internal embeddedness that could be a pivotal

relational source, development and effective deployment of internal knowledge transfer mechanisms can make a real difference for improving MNE subsidiaries' innovation performance. This contribution puts knowledge transfer into the research spotlight as an effective mediating force between embeddedness and innovation performance.

Third and more importantly, we probe into the boundary conditions of our framework and explore the role of external search depth and breadth. Despite increasing recognition of external search as an essential force for innovation (Dahlander et al., 2016; Laursen, 2012; Ren et al., 2015; Wang, 2015), past research on innovation networks (Ahuja, 2000; Capaldo, 2007; Lincoln et al., 2017) has overlooked the role of external search as a potential boundary condition to the relationship between knowledge transfer and innovation performance.

We highlight that whether MNE subsidiaries follow broad or concentrated approaches when organizing a search for new ideas and technologies for innovation can have an opposite effect on the influence of knowledge transfer on subsidiary innovation performance. Therefore, we position external search depth and breadth as significant contingencies to the linkages between knowledge transfer and innovation performance. We illustrate that knowledge transfer's role in innovation performance cannot be fully understood without accounting for external search approaches manifested at the interface between MNE subsidiaries and external environment.

2. Theoretical background

2.1. The relational view of innovation

Firms' survival and creation of economic value are explained by their ability to obtain innovation performance (Forés & Camisón, 2016). Accordingly, MNEs are in a constant search to find unique resources in order to improve their and their subsidiaries' innovation performance (Chiang & Hung, 2010; Laursen, 2012; Ferraris, Bresciani & Del Giudice, 2016). In this paper, we draw primarily on the relational view (RV) (Dyer & Singh, 1998) as a

theoretical lens to explain the internal enablers of subsidiary innovation performance. The core premise of RV suggests that firms' critical resources span their boundaries and are embedded in network interactions and routines (Dyer & Singh, 1998). As such, relationship networks in which firms and their employees are embedded affect their behavior, evolution, and performance (Borgatti & Foster, 2003). Drawing on both network paradigm (e.g., Borgatti & Foster, 2003) and resource-based perspective (e.g., Russo & Fouts, 1997), RV has gained recent attention from innovation management and strategy (e.g., Ebers & Maurer, 2014; Faems et al., 2005). Such increased attention has placed RV as one of the primary theoretical lenses to explain antecedents, mechanisms, and consequences of innovation and change.

According to the RV, relation-specific assets, knowledge-sharing routines, and complementary resources/capabilities are the essential sources of innovation and competitive advantage (Dyer & Singh, 1998; Faems et al., 2005). These elements can be viewed as essential ingredients for successful innovation. While RV is principally applied in interorganizational context (Dyer & Singh, 1998), it has also found its applications to intraorganizational relational phenomena that take place across business units (Bradbury & Lichtenstein, 2000). In particular, RV is argued to allow understanding the intersubjective and interdependent nature of organizational life (Bradbury & Lichtenstein, 2000). The way subsidiaries are embedded within the network of parent MNEs, and the way knowledge flow is managed in such networks can influence innovation processes and outcomes (Ebers & Maurer, 2014; Lincoln et al., 2017). Accordingly, the relevance of RV within organizational boundaries makes it a proper approach to understanding innovation performance through internal relational forces.

2.1.1. Internal embeddedness

Embeddedness is a major concept in RV literature (Ebers & Maurer, 2014; Moran, 2005). It denotes the nature of the reliance on a network and the influence of social relations (Kim, 2014). It is primarily rooted and examined through different approaches in network research

(Capaldo, 2007; Kim, 2014; Moran, 2005; Rowley, Behrens, & Krackhardt, 2000). Socioeconomic actors' embeddedness in a network of relationships has clear implications for their position in, sense-making of, and interactions across such relationships.

Based on RV and network research, three salient dimensions of embeddedness are structural, cognitive, and relational embeddedness (Moran, 2005; Rowley et al., 2000). Structural embeddedness denotes the value of the structural position in an extended network (Kim, 2014), and it concerns the properties of the network of relationships as a whole (Nahapiet & Ghoshal, 1998). Cognitive embeddedness denotes shared representations, interpretations, and systems of meaning among parties that limit economic behavior and are manifested in bounded rationality (Breton-Miller & Miller, 2009). Relational embeddedness describes the kind of relationships actors have developed through interactions (Nahapiet & Ghoshal, 1998).

Social capital is a central concept in network research (Moran, 2005; Nahapiet & Ghoshal, 1998) that shares some overlapping tenets with embeddedness. Social capital is recognized as a broad overarching concept and fundamental resource for firms (Inkpen & Tsang, 2005; Nahapiet & Ghoshal, 1998; Partanen et al., 2008; Tsai & Ghoshal, 1998). Social capital is composed of structural (overall pattern of connections between actors), cognitive (shared meaning and understanding among network parties), and relational (the kind of personal relationships people have within the network) dimensions (Inkpen & Tsang, 2005; Nahapiet & Ghoshal, 1998). The role of strong versus weak ties in various innovation and performance outcomes comprises a vital research stream and debate among scholars (e.g., Granovetter, 1973; Wuebker, Hampl, & Wüstenhagen, 2015).

Structural and relational dimensions of social capital are closely intertwined with embeddedness. Some research even views embeddedness as a component of social capital (Moran, 2005). Still, embeddedness cannot be equated to social capital. While social capital, in its essence, is a relational resource (Inkpen & Tsang, 2005; Nahapiet & Ghoshal, 1998; Tsai

& Ghoshal, 1998), embeddedness is a socioeconomic entity's (e.g., firm or individual) changing state in its network (Ciabuschi et al., 2014; Hallin, Holm, & Sharma, 2011; Uzzi, 1997). Embeddedness can be seen as an integral ingredient of social capital (Moran, 2005), while it is also a force of its own with pivotal influences on network and innovation outcomes.

We concentrate on the internal embeddedness of subsidiaries in this research. A subsidiary's internal embeddedness revolves around the characteristics of its internal network and emphasizes the relationships among various internal network actors, such as MNE headquarters (HQs) and sister subsidiaries (Andersson et al., 2005). Subsidiaries' identity and actions are primarily embedded in their parent and sister firms' network. Familiar, reciprocated, and bounded ties across business units and subsidiaries shape the way subsidiaries conduct business and manage knowledge (Hansen, 1999).

2.2. Knowledge transfer and knowledge sources

In addition to being a strategic ingredient for innovation (Capaldo, 2007), a primary attribute of knowledge is that it can be developed in one setting but utilized in others (Gupta & Govindarajan, 2000). As knowledge is generated in different parts of the MNE and transferred to several interconnected units, ability to build and transfer knowledge within MNE boundaries is a significant competitive advantage (Minbaeva et al., 2003). Research interest in knowledge accumulation and management within MNEs, as well as knowledge sources and flow of knowledge within and across MNEs boundaries, has been growing (Andersson et al., 2005; Ciabuschi, Kong, & Su, 2017; Gupta & Govindarajan, 2000; Santangelo, 2012). This growing interest is reflected in the role of knowledge flows in innovative outcomes of various socioeconomic actors (Breschi & Lissoni, 2001; Gittelman, 2006; Vaccaro, Parente, & Veloso, 2010).

Knowledge transfer refers to a comprehensive set of procedures germane to transferring the knowledge from MNEs units to its final utilization by the receiving unit (Minbaeva et al.,

2003). According to the knowledge-based view (KBV), the firm is conceptualized as an institution for integrating knowledge, and knowledge is argued to reside within the individual and applied by the firm (Grant, 1996). Moreover, KBV highlights that different subsidiaries of MNEs, as well as headquarters to have unique repositories of their own knowledge (e.g., Song, 2014; Zeng, Grøgaard, & Steel, 2018). Local subsidiaries of MNEs absorb knowledge from their social context as they operate directly in the markets and interact with customers (e.g., Leposky, Arslan, & Kontkanen, 2017). Therefore, other subsidiaries of MNEs are increasingly being viewed as a vital source of knowledge along with headquarters for MNEs (e.g., Ferraris et al., 2017). As a result, KBV indicates that the integration of both the vertical and horizontal transfer of knowledge across actors is needed.

Knowledge transfer is anything but a purely mechanistic procedure. It is a challenging search and application procedure across units within MNEs (Monteiro, Arvidsson, & Birkinshaw, 2008). Due to the personal and often tangled nature of what is to be transferred, such procedure can be a sophisticated and shaped by relational dynamics (Dyer & Hatch, 2006; Kazadi, Lievens, & Mahr, 2016; Zeng et al., 2018). For example, MNEs and their subsidiaries can experience tensions in information sharing across their channels due to the simultaneous existence of competition and embeddedness across MNE subsidiaries (Santangelo, 2012; Song, 2014). As knowledge can be seen as a product of relationships of a business actor with internal and external actors (Capaldo, 2007; Vaccaro et al., 2010), how knowledge flows across business units can have significant implications for the way firms produce innovations.

Given the intangible, processed, specific, and valuable nature of knowledge (Grant, 1996), knowledge transfer requires high trust and tight coordination between exchanging actors (Hansen, 1999). Different types of knowledge such as marketing know-how, technology, and process designs require different channels to flow (Gupta & Govindarajan, 2000; Minbaeva et al., 2003). However, all these channels function on the basic premises of trust and coordination.

Thus, dense, closed, and relatively homogeneous networks within MNEs are often functional domains of smooth and fast intra-network communication flow and thick transfers of tacit knowledge (Lincoln et al., 2017).

As emphasized by Wang et al. (2019), existing studies present insufficient information regarding why the transfer of innovation does not necessarily lead to subsidiary power gains. They show that the formal attention of the parent company mediates the relationship between the reverse transfer of innovation and subsidiary power (Wang et al., 2019). Nair, Demirbag, and Mellahi (2015) point to the fact that higher levels of collaboration facilitate Indian subsidiaries' reverse knowledge transfer to the parent firm, and this effect is more significant in knowledge-intensive industries. In this vein, perceived subsidiary capability, knowledge relevance, and absorptive capacity are positively associated with reverse knowledge transfer (Nair, Demirbag, & Mellahi, 2016). These findings highlight the notion that knowledge transfer is intertwined with how MNE subsidiaries operate within their internal network and the way they learn from their external environment.

2.3. External search depth and breadth

As firms' knowledge management activities are inextricably intertwined with their external activities (Mukherjee et al., 2017), the relationship between knowledge transfer and innovation performance is subject to boundary conditions. Hence, though internal knowledge transfer constitutes a primary source of innovation for MNEs (Minbaeva et al., 2003), their innovation outcomes depend on access to a variety of input to external sources (Laursen, 2012). A major element of the innovation process involves the way firms carry out organizing a search for new external ideas and technologies for innovation (Laursen & Salter, 2006). In particular, MNE subsidiaries play a critical role in external search as instrumental boundary-spanning agents of their parent firms (Kostova & Roth, 2003). Firms' search activities enrich their knowledge pool and help build complementary assets for innovation (Ren et al., 2015).

Research on external search can be seen as a response to and the advancement of earlier research on innovation that adopts a primarily internal view (Monteiro et al., 2008; Tsai & Ghoshal, 1998). This stream of literature highlights the importance of external knowledge for innovation and examines boundary-spanning activities and agents that enable external search (Dahlander et al., 2016; Rosenkopf & Nerkar, 2001). Accordingly, external search is considered an instrumental set of activities to identify and acquire external information for strategies goals such as knowledge development, value creation and innovation (Dahlander et al., 2016; Laursen, 2012; Ren et al., 2015). Nonetheless, external search relies on various distinct approaches -two major ones being search depth and search breadth (Wang, 2015)- that rely on different activities and network ties and concentrate on different information types.

Whether firms have concentrated access from external channels (search depth) or limited knowledge access from a broad range of external channels (search breadth) can have important implications for their innovation outcomes (Chiang & Hung, 2010; Ren et al., 2015). Micro-macro processes that build MNEs' social capital also plays an instrumental role in external knowledge search (Kostova & Roth, 2003). In particular, subsidiaries searching external knowledge widely and deeply can have an interesting interaction with their internal knowledge transfer practices.

External search breadth is defined as the number of external channels from which the firm accesses knowledge (Laursen & Salter, 2006, p. 140). Search depth, on the other hand, refers to the extent to which firms draw ideas intensively from external sources (Chiang & Hung, 2010). When firms follow search breadth strategies, they often go through trials and errors to learn how to gain knowledge from various external sources. Before selecting the most rewarding ones, they must make extensive effort and time to comprehend the norms, habits, and routines of different knowledge channels (Wang, 2015). When they follow search depth strategies, they draw knowledge heavily from a concentrated set of sources or search channels

(Laursen & Salter, 2006). They are more likely to gain deeper yet perhaps redundant insights through strong relationships with close partners.

Knowledge searched through a breadth approach tends to be less redundant and exhibit a greater variety but is more complicated and costly, while knowledge searched through a depth approach tends to be more redundant and exhibit less variety but is less complicated and costly (Mukherjee et al., 2017; Wang, 2015). Likewise, while external search breadth is better aligned with the pursuit of new knowledge that leads to more variations and new value, external search depth is better aligned with refining and deepening existing knowledge to enrich the present value of the firm's offerings (Chiang & Hung, 2010). These characteristics of external search depth and breadth are likely to shape the way knowledge transfer within MNE boundaries translates into subsidiary innovation performance.

3. Hypotheses

3.1. Internal embeddedness, knowledge transfer, and subsidiary innovation performance

Communication and reciprocity between internal actors of MNEs are positively linked to knowledge flows (Monteiro et al., 2008). Embedded ties are expected to outperform unembedded ties when it comes to interdivisional knowledge transfers among functions (Hansen, 1999). Parent MNEs and sister units can provide their well-embedded subsidiaries with resources and capabilities that can facilitate and expedite knowledge transfer across units within MNE. On the contrary, "weak" or superficial ties that are not rich enough to enable the depth of knowledge transfer needed to create novel innovation (Hansen, 1999).

Furthermore, recurring ties with familiar actors can enhance trust and certainty that are requirements for the diffusion of unique and inimitable insights (Lazzarini, Miller, & Zenger, 2008). MNEs can produce internal sources for innovation relying on activities such as knowledge creation and R&D (Andersson et al., 2005; Gupta & Govindarajan, 2000). Whatever the MNE has at hand as a potential source of innovation, can better to be

accumulated, assimilated, and utilized, if subsidiaries are well connected to sister firms and business units within MNEs (Ciabuschi et al., 2014). Thus, we hypothesize that:

H1: *A subsidiary's internal embeddedness is positively associated with the subsidiary's A) degree of knowledge transfer from other units within MNE and B) innovation performance.*

We draw on the view of knowledge transfer as a sophisticated procedure (Monteiro et al., 2008) and argue that it can serve a linking pin between subsidiaries' internal embeddedness and innovation performance. Our reasoning is rooted in the notion that internal embeddedness can be seen as a relationship-based state that requires mediation of relevant procedures to manifest its influence on outcomes like innovation performance. This means relevant procedures like knowledge transfer is required to capitalize on embeddedness between MNE subsidiaries and internal MNE network and materialize potential synergies for innovation. Internal embeddedness can spur increased knowledge transfer (Hansen, 1999). Knowledge transfer, in turn, can lead to increased innovation performance (Arvanitis & Woerter, 2009; Gittelman, 2006), as innovation requires knowledge flow across business actors to take place (Arvanitis & Woerter, 2009; Gittelman, 2006).

This position finds indirect support in the literature. Intraorganizational communication and knowledge transfer are argued to be essential underpinnings of successful innovations (Ciabuschi et al., 2014; Vaccaro et al., 2010). Similarly, Monteiro et al. (2008) found that a subsidiary's level of knowledge exchange in the MNE is underlain by its status within the MNE network and enhances the subsidiary's performance. This phenomenon indicates that while the subsidiary's internal embeddedness shapes the extent and way it conducts knowledge transfer activities, knowledge transfer procedures play an instrumental role in conveying the influence of embeddedness on innovation performance. Based on this discussion, we hypothesize that:

H2: *The degree of knowledge transfer from other units within MNE to a subsidiary A) is positively associated with the subsidiary's innovation performance and B) mediates the relationship between subsidiary's internal embeddedness and innovation performance.*

3.2. The moderating role of external search depth and breadth

Given its nature, external search depth indicates an attention to detail and profound appreciation of valuable knowledge. Subsidiaries employing in-depth search practices can better utilize knowledge transfer due to procedures underpinned by a high level of trust and coordination between the parties involved in knowledge transfer (Chiang & Hung, 2010). High-levels of trust and coordination between the parties are in line with the core promises on strong ties (Wuebker et al., 2015), as strong ties are often characterized by deeper relational involvement, commitment, and trust. In-depth search procedures are, therefore, typically consistent with the interplay between knowledge transfer and innovation performance. In other words, the linkage between knowledge transfer practices and innovation performance can be stronger when subsidiaries develop and apply in-depth search routines.

Deep and strong linkages with a particular knowledge source can catalyze the role of fine-grained knowledge transfer in the pursuit of innovation performance (Wang, 2015). Strong ties grants firms with valuable and unique social capital to foster and facilitate how knowledge transfer is exploited for innovative purposes. As the firm digs into familiar external actors' knowledge, it becomes more easily comprehensible, allowing the firm to acquire valuable external information and apply it toward innovative ends that could not be attained through a shallower search (Cruz-González et al., 2015). In turn, such unique and appreciated information could readily be applied toward innovative goals through existing knowledge transfer routines. This is in line with Hsieh and Tidd's (2012) finding that innovative projects were linked to stronger interactions with external actors and the adoption of richer mechanisms for knowledge-sharing. Based on this discussion, we hypothesize that:

H3A: *Search depth positively moderates the link between the degree of knowledge transfer from other units within MNE to a subsidiary and innovation performance.*

On the other hand, cultivating external search breadth across multiple types of actors can come at the cost of time required to comprehend how external knowledge can be incorporated into the firm, as it takes substantial effort (Dahlander et al., 2016). Given the often unfocused and experimental nature of search breadth, firms employing broad search practices may experience disorientation and ambivalence in making sense of and applying a vast variety of external information. Search breadth sustained by weak ties in and across extended networks can bring in a variety of novel insights (Granovetter, 1973). However, the sheer size and diversity of these insights and ideas can sometimes be overwhelming to process, and the possible catalyst role of external search breadth in the linkage between knowledge transfer and subsidiary innovation performance can be curtailed or reversed. In fact, that weak ties impede the transfer of complex knowledge (Hansen, 1999) can indicate a darker side of search breadth in relation to turning knowledge transfer into innovation outcomes.

Likewise, although search breadth enables firms to identify and acquire new valuable information from a high number of external actors, its superficial attribute may exhibit a negative moderating role in the way firms apply their knowledge base (Cruz-González et al., 2015). In such contexts, the challenge of integration of diverse information can become a major obstacle to innovation performance (Mors, 2010). This is because firms' ability to determine the value of new external information, incorporate it, and utilize it is a function of their preceding knowledge in associated areas, making it problematic for firms to benefit from the diverse external information in distant fields (Cohen & Levinthal, 1990).

Drawing on these lines of arguments, we argue that, its potential benefits aside, search breadth may be less fruitful for subsidiaries with high internal embeddedness and rich internal knowledge transfer practices. Overly strong relationships may have unique benefits but often

hinder access to new information (Nell & Andersson, 2012), while sole emphasis on weak ties can impede insights unique to close relationships. It may become paradoxical for subsidiaries to simultaneously invest in strong internal relationships and knowledge sharing procedures and experimental search of information from various weak external ties (Uzzi, 1997). Each approach could dilute or even cancel out the other. Transcending structural holes could offer potential exploratory value for innovation (Ahuja, 2000) but could simultaneously jeopardize the effectiveness of rich internal knowledge transfer practices for subsidiary innovation performance. Therefore, we hypothesize that:

H3B: *External search breadth negatively moderates the link between the degree of knowledge transfer from other units within MNE to a subsidiary and innovation performance.*

----------INSERT FIG. 1 HERE----------

Fig. 1 depicts the hypothesized relationships in our conceptual framework.

4. Methodology

4.1. Data collection and study sample

For this study, we drew on the largest 500 corporations in the world as published by Fortune magazine - one of the most critical annual rankings of companies worldwide (published in 2015 but it refers to the previous fiscal year). Revenue figures include consolidated subsidiaries and reported revenues from discontinued operations but exclude excise taxes. Companies are ranked by total revenue for their respective fiscal years ended on or before March 31. All companies on the list must publish financial data and report part or all of their figures to a government agency. Some previous studies based on this (e.g., Legendre & Coderre, 2013; Ma, Tong, & Fitza, 2013). From this list, we identified all the 152 European MNEs that were listed in the Amadeus database. Amadeus is a database of comparable financial and business information on Europe's largest 515,000 public and private companies by total assets. Amadeus is published by Bureau van Dijk / Moody's Analytics and

includes standardized annual accounts, financial ratios, sectoral activities, and ownership data. It is a major publisher of business information and specializes in private company data combined with software for searching and analyzing companies. Some previous studies also used this data source (e.g., Brouthers, 2013; Ferraris et al., 2017).

The HQ CEOs of these MNEs were contacted asking them to identify those of their subsidiaries that were suitable to our research objectives following some criteria: a) being active in innovation activities; b) being active in knowledge creation and transfer; c) being at least 15 years old; d) having more than 250 employees. This enabled us to select those subsidiaries that were more proactive (Ferraris, 2014). We then sent out a survey to 489 European subsidiaries in June 2014. Reminders followed up the initial survey in November 2014 and February 2015. Our respondents were subsidiaries' CEO because they are responsible for the management of subsidiaries (that is the unit of analysis for this study) and they are the most suitable person that can address critical questions useful for this analysis. This is common in some previous studies on similar topics (e.g., Hallin et al., 2011). CEO average tenure in the company was 5.5 years while the average age was 48.2 years old.

Using a standardized questionnaire built on mainstream studies on the topic (e.g., Yamin & Andersson, 2011), we developed survey questions which appropriately addressed study variables (as explained in the next section). The response rate to study questionnaire was 23% and, due to incorrect answers or missing values, the final sample included answers from 91 subsidiaries of 11 MNEs. The subsidiaries were located in 10 European countries (Belgium, Finland, Germany, Italy, the Netherlands, Poland, Portugal, Russia, Spain, and Switzerland); thus, the national and managerial cultures varied. On average, each HQ has eight subsidiaries; the minimum was 5 and the maximum14 showing a quite well-homogenized distribution. The Service Industries in which the subsidiaries operated were: Banking and Insurance (16),

Information and Communication Technologies (40), Wholesale Trade (23), Transportation (12), and others (19).

To limit errors due to common-method bias related to the use of self-report data, we took two different precautions. First, we conducted a Harman's One-factor test (Harman, 1967) where it has been discovered several factors (four factors with an eigenvalue greater than 1) that accounted for 20, 13, 13 and 13 percent of the variance, respectively, which shows that common method variance is not a serious problem in our data. Second, we constructed the questionnaire spreading and mixing across it the items of each variable in order to avoid socially desirable answers so that they were not bundled together. Thus, we could assume that our study is not affected by common method bias. Non-response bias was investigated by comparing early and late respondents (Armstrong and Overton (1977). 25% of total respondents who had answered the questionnaire after receiving more than one reminder have been labeled as "late respondents." This was compared with the early respondents based on measures used in this study. Responses were virtually identical, limiting this kind of biases.

4.2. Study Variables

4.2.1. Subsidiary's internal embeddedness

The variable internal embeddedness captures the characteristics of the core subsidiary's internal network by examining the relationships among MNC's HQ and sister subsidiaries (Hallin et al., 2011). The variable comprises four indicators that each reflect the relationships among subsidiaries' internal business networks. Subsidiary CEOs were asked to evaluate "how much your relationships with MNC counterparts (HQ or sister subsidiaries) are characterized by the ….": a) degree of specific adaptations in technology among network counterparts, b) long-term orientation and stability of the relationships, and the level of c) interdependence and of d) mutual trust (Hallin et al., 2011). The indicators were measured on a five-point Likert-

type scale ranging from 1 (very low) to 5 (very high). The average value was used when constructing the variable.

4.2.2. Degree of knowledge transfer (mediator)

The operationalization of this variable was adopted from Gupta and Govindarajan (2000) and Minbaeva (2007). Subsidiaries' CEOs were asked the following: "what are your opinions on the degree of knowledge transferred from the other units within MNC (HQ or sister subsidiaries) to their subsidiaries concerning the …": a) marketing know-how, b) distribution know-how, c) packaging design/technology, d) product designs, e) process designs, f) purchasing know-how, g) management systems and practices. We used a five-point Likert-type scale in line with (Gupta & Govindarajan, 2000; Minbaeva, 2007)) in order to collect data on the following items (from 1: very low, to 5: very high). A composite index reflecting the degree of knowledge transferred from the focal subsidiary was measured averaging the scores.

4.2.3. External search depth and breadth (moderators)

We based on the study of Laursen and Salter (2006) to address external search depth and breadth using 16 different external sources of knowledge (see Table 1). Regarding search breadth, we simply counted the number of sources used by the subsidiary. We coded this variable as 1 (low) when the subsidiary relies on 1-3 sources, as 2 (medium) when it relies on 4-6 sources and as 3 (high) when it relies on seven sources or more. Regarding the construction of the variable search depth, each of the 16 sources is coded with 1 when the firm in question reports that it uses the source to a high degree and 0 in the case of no, low, or medium use of the given source. In this case, the variable was built by adding individual sources. We coded this variable as 1 (low) when the subsidiary relies deeply on 1-2 sources, as 2 (medium) when it relies deeply on 3-4 sources and as 3 (high) when it relies deeply on five sources or more.

4.2.4. Subsidiaries' innovation performance

We use for each subsidiary the fraction of the firm's turnover on products new to the MNC (% of new products on the total turnover of the subsidiary). This was our dependent variable (SubInnoPerformance).

4.2.5. Control variables

Some additional variables that can influence the relationships of our hypothesized framework have been included in the regression analysis. These are subsidiary's age and size, innovation type, entry mode, R&D intensity, and industries. The first of which is subsidiary age because it may affect the probability that the subsidiary has developed a high level of internal embeddedness and external channels for innovation (Andersson et al., 2005). We measured it using the natural logarithm of the number of years the subsidiary has existed. We also controlled for subsidiary relative size (Ciabuschi et al., 2011; Yamin & Andersson, 2011) because the bigger is the subsidiary, the higher the likelihood in absorbing and implementing innovations from both the internal and external counterparts (Dellestrand, 2011). We measured it using the number of subsidiary's employees compared to the whole MNC total numbers. According to Bresciani and Ferraris (2016), we include a dummy variable controlling for the type of innovation that is prevalent in the subsidiary's activities distinguish between product and marketing innovation (1=product, 0=marketing). Moreover, entry mode was evaluated through a dummy variable (1 for joint venture and 0 for wholly owned subsidiaries).

Then, we measured R&D intensity through a logarithmic transformation of two indicators: the R&D budget and the number of R&D employees (Alegre et al., 2011). We add this control because investing in internal R&D provide individuals and organizational units with the capacity to facilitate access to internal and external knowledge intensive relationships. In fact, during the time individuals learn or absorb knowledge by associating it their existing base of knowledge (Cohen & Levinthal, 1990). Finally, it has been included a dummy variable

to control for the industry to which subsidiary belonged (1=Knowledge Intensive Business Services, commonly known as KIBS, 0=others).

5. Analysis and results

Ordinary least squares (OLS) regression was used to test hypotheses 1 and 2. Hypothesis 3 was tested using moderation analysis and centered variables (Aiken & West, 1991). Mediation effect requires the following conditions (Baron & Kenny, 1986): a) the relationship between subsidiary's internal embeddedness (the independent variable) and the degree of knowledge transfer (the mediator) should be significant; b) when controlling for subsidiary's internal embeddedness, we should find a significant relationship between the mediator and subsidiary's innovation performance (our dependent variable); c) the strength of the association between subsidiaries' internal embeddedness (the independent variable) and subsidiary's innovation performance (the dependent variables) typically decreases. Table 1 shows descriptive statistics, correlations and reliability coefficients for the study variables.

----------INSERT TABLE 1 HERE----------

Hypotheses 1 and 2 predicted positive relationships among independent, dependent and moderator variables of our study. Moreover, hypotheses 3 predicted search depth would positively moderate the relationship between the degree of knowledge transfer and subsidiary's innovation performance (H3A) and external search breadth negatively moderate the same relationships (H3B).

The study results presented in Table 2, show that we receive support for all hypotheses, except hypothesis 3B, where the moderating relationship is found to be non-significant. We can observe from the results that subsidiary's internal embeddedness was significantly related to subsidiary's innovation performance (Model 1: $B=.74$, $t=2.35$, $p<.05$), and to the degree of knowledge transfer (Model 2: $B=.40$, $t=3.48$, $p<.001$). This supports hypothesis 1A and 1B. Then, the relationship between the degree of knowledge transfer and subsidiary's innovation

performance is positive and significant when controlling for subsidiaries' internal embeddedness (Model 3: B=.53, t=2.05, p<.05). This confirms hypothesis 2A. At the same time, for the conditions of mediation to be met, both subsidiaries' internal embeddedness and degree of knowledge transfer must be related to the mediators, and the relationship of the predictor on the dependent variable must be diminished (partial mediation) or non-significant (fully mediation). In our analysis, the association between subsidiaries' internal embeddedness and subsidiary's innovation performance become non-significant (Model 3: B=.52, t=1.57, p=.119), confirming H2B. This means that we found a full mediation effect of knowledge transfer (Beenen & Pichler, 2014) on the relationship between subsidiaries' internal embeddedness and innovation performances.

Moreover, when the hypothesized moderators (search depth and breadth) were entered into the model (Model 4) we found a stronger significant coefficient only for the interaction term "knowledge transfer x search depth" (B=.81, t=2.84, p<.05), while the coefficients for knowledge transfer was weaker and no longer significant (Model 4: B=.-1.08, t=- 1.87, p=.097). The 95 percent confidence intervals for indirect effects of knowledge transfer through search depth included zero (–.372 to .624) and the confidence interval for indirect effects of search breadth did not include zero (.241 to 1.369). Overall, this result supported H3A but not H3B suggesting a positive moderator effect of search depth but not that of search breadth on the relationship between knowledge transfer and subsidiary's innovation performance.

----------INSERT TABLE 2 HERE----------

In table 3, we present the conditional effects of the focal predictor at values of the moderator(s). Our results showed that search depth pulls the effect of knowledge transfer on innovation performance. A subsidiary that has a higher propensity in external search depth amplify the positive effect on innovations (1.45, 1.58, and 1.58) regardless of the level (low, medium or high) of search breadth. The same is for firms that have a medium propensity in

external search depth with a smaller multiplicative effect (0.77). Graphically, the effect of search depth on the relationships between the degree of knowledge transfer and subsidiaries' innovation performance is proposed in Figure 2.

----------INSERT TABLE 3 HERE----------

----------INSERT FIG. 2 HERE----------

6. Discussion

Innovation is the make-or-break factor for a firm's long-term performance and survival especially amid current market forces (Forés & Camisón, 2016). Accordingly, firms construct their unique strategies to achieve innovation performance and ensuing competitive advantage. However, unpredictable and complex nature of innovation entails reliance on network resources, exploration, and sophisticated procedures to convert such resources into successful innovation outcomes (Dahlander et al., 2016; Kazadi et al., 2016). In this research, we strived to examine the nature of the linkage between MNE subsidiaries' internal embeddedness and innovation performance through the analysis of mediating role of knowledge transfer and moderating role of external search depth and breadth.

6.1. Theoretical contributions and implications

Our research makes theoretical contributions to several research streams. First, our results add to earlier studies that acknowledge the role of embeddedness (Lincoln et al., 2017) in creating awareness of and facilitating procedures for innovation opportunities (Ciabuschi et al., 2014). The innovation potential of MNEs' internal networks is substantiated by the fact that MNEs operate across different countries (Meyer, Mudambi, & Narula, 2011), resulting in access to diverse resources and learning opportunities, which can potentially produce innovations fitting the context they operate in (e.g., Du & Williams, 2017). Consequently, if MNE subsidiaries are internally embedded, knowledge flow and learning are expected to be more effective (Ciabuschi et al., 2017; Kazadi et al., 2016) leading to better innovation performance.

Furthermore, our findings reveal that knowledge transfer serves as a linking pin between internal embeddedness and innovation performance and cement the central place of knowledge transfer in the relational view (RV) of innovation strategy (Arvanitis & Woerter, 2009; Leischnig, Geigenmueller, & Lohmann, 2014). Our findings contribute to the RV line of thought by highlighting that MNE subsidiaries may need effective knowledge transfer practices across different business units to leverage network resources for innovation performance. As embeddedness can lead to either positive or negative outcomes such as relational inertia, resource misallocation, and potentially malfeasance if not channeled positively (Day et al., 2013), knowledge transfer emerges as a necessary means to leverage internal embeddedness and convey its role in innovation performance. The mediating role of knowledge transfer in conveying the impact of embeddedness on subsidiary innovation performance shows that relational sources need to be channeled through knowledge flowing procedures to manifest their positive impact on innovation outcomes. Thus, our second contribution is rooted in knowledge transfer's conceptualization within the RV theoretical domain and illustrating its mediating role in translating internal embeddedness into innovation performance.

The study results also support the positive moderating influence of external search depth on the link between the degree of knowledge transfer from other MNE units to the focal subsidiary and its innovation performance. This finding means that internal knowledge sources require the complementary role of having concentrated access to information from external channels for MNEs to develop innovations for all their needs. In-depth and exclusive input from external sources is required to reinforce the influence knowledge transfer mechanisms have on subsidiary innovation performance (Chiang & Hung, 2010; Laursen, 2012). Likewise, the finding implies that the way external search is conducted can have an instrumental influence on how knowledge transfer is translated into innovation performance. Accordingly, our third contribution informs the interplay between external search depth and knowledge transfer in

MNE subsidiaries' pursuit of innovation, and it highlights that corporate processes for transferring internal knowledge need to be complemented by the high degree of in-depth information from the select set of valued external sources to realize their potential.

Non-significant result for the expected moderating role of search breadth is somewhat surprising. Extant literature suggests that external search depth and breadth are divergent and can play different roles in innovation (Chiang & Hung, 2010; Ren et al., 2015). However, though external search breadth may offer diversity-related benefits for innovation performance outcomes, people adopting external search breadth may have limited attention for search as cultivating breadth consumes attention (Dahlander et al., 2016). This may mean that the possible role of external search breadth can be canceled out due to managerial challenges related to dealing with extreme heterogeneity and the lack of attention at European subsidiaries. It is also possible that the effect of search breadth may be not caught in short-term but mainly in the long-term, as search breadth is likened to exploration with long-term focus (Chiang & Hung, 2010). MNE subsidiaries adopting external search breadth approach may need to wait longer for its returns, even if such a search approach is adopted effectively.

Our findings on relational and procedural enablers of European MNE subsidiaries' innovation performance indicates that innovation management, strategic management, and international business are inextricably intertwined both inter terms of theory and practice. Therefore, a key theoretical implication of our study relates to offering a more holistic view of the strategic management of innovation in MNE subsidiaries. Earlier management studies emphasized the importance of internal embeddedness in creating economies of time, allocative efficiency and sophisticated adaptation in subsidiaries (e.g., Uzzi, 1997). We address innovation performance in MNE subsidiaries by adopting an inclusive approach to potential relational and procedural forces, where internal factors of internal embeddedness and knowledge transfer from other units and external factors of search depth and breadth are

addressed. Thus, our research advances the RV of innovation strategy (e.g., Capaldo, 2007) and explicates the mediating means and boundary conditions of the impact of MNE subsidiaries' internal embeddedness on their innovation performance.

The role of embeddedness in subsidiary innovation management is neither direct nor universally pronounced but mediated by knowledge transfer and moderated by external search. This is in contrast to the conventional approach in management research that often tends to consider enablers and drivers of innovation performance through a singular perspective (e.g., Capaldo, 2007; Faems et al., 2005; Laursen & Salter, 2006). Therefore, we highlight the importance of addressing innovation performance linkage in MNE subsidiaries by combining arguments from multiple literature streams of innovation, MNE subsidiaries, internal knowledge transfer, and knowledge search depth and breadth. This aspect needs the attention of academics aiming to address this complex topic because limiting theorizing to a specific literature stream cannot appropriately address innovation, as it is a complex topic requiring multidisciplinary input while theorizing and subsequently analyzing empirically. Hence, beyond the use of RV, our research advocates theoretical pluralism in investigating a sophisticated phenomenon like innovation strategy in MNEs. Importantly, our findings indicate that relational and procedural enablers of innovation need to be jointly investigated and boundary conditions shaping the nexus of relationships among these factors need to be accounted for to arrive fuller understanding of innovation performance of MNE subsidiaries.

6.2. Managerial implications

MNE subsidiaries operating in foreign countries often face the challenge of dual embeddedness (Bresciani & Ferraris, 2016; Ciabuschi et al., 2014). This duality may create tension between internal and external sources of information. However, a key takeaway from our study is that internal relational knowledge sources (embeddedness) and external knowledge sources (search depth and breadth) can be complementary rather than mutually exclusive and these sources can

be linked through effective knowledge transfer practices. This becomes especially useful for MNE managers entering or operating in foreign markets, where despite having a good set of organizational practices for innovation development, without external input, those innovations (both products and services) may not satisfy foreign market needs. Hence, subsidiary managers and boundary spanners that are deeply embedded in their MNEs should pay further attention to drawing unique knowledge from a concentrated set of trusted sources or search channels in foreign markets.

Likewise, although the knowledge-based view of the firm argues that knowledge is a vital source of competitive advantage (Grant, 1996), management and transfer of knowledge can be daunting for MNEs. Given this notion vis-à-vis our findings, MNE subsidiaries are advised to pay particular attention to knowledge transfer practices and make necessary investments in knowledge transfer to transform internal and external innovative inputs into innovation performance successfully. This means managers should develop organizational and activity structures that are conducive for knowledge transfer with the boundaries of MNEs and support behavioral mechanisms, i.e., intraorganizational trust, and cross-functional cooperation amongst others, that underpin successful knowledge transfer. In particular, given mediating role of knowledge transfer for the link between internal embeddedness and innovation performance, MNE subsidiary managers should understand intraorganizational relationships need to be directed through relevant procedures and invest in marrying relational (embeddedness) and procedural (knowledge transfer) elements of managing knowledge for innovation.

Finally, knowledge transfer should not be viewed in isolation to external knowledge sources and boundary-spanning activities to acquire external knowledge. MNE subsidiary managers should be cognizant of the interplay between knowledge transfer and external search and adopt an integrative approach to these distinct activities. Specifically, though delineation

between internal knowledge transfer and external search is granted, managers and boundary-spanning agents are advised to work together to integrate these activities and comprise major external search approaches for improved innovation performance. The synergy ignited by in-depth external information and transferred internal knowledge can generate unique knowledge bundles and configurations feeding superior innovation outcomes. Consequently, MNE subsidiaries are advised to encourage and support close collaboration between MNE subsidiaries' boundary spanners responsible for external search and cross-functional team members responsible for internal knowledge transfer to create such synergy.

6.3. Limitations and future research avenues

Our paper also has limitations. First, we focus on innovation performance topic in a specific context of MNE subsidiaries, which operate across national borders. Therefore, some argumentation and findings from our paper may not be valid for small firms and their innovation-performance analysis. Second, the empirical context of our study is based on MNE subsidiaries located in European economies, which traditionally represent the high end of the innovation index within MNEs. Moreover, sample MNEs are also headquartered in Europe. Therefore, discussion on internal knowledge transfer and innovation performance may not represent dynamics for subsidiaries of European MNEs in culturally different Asian, African or Latin American countries. Our paper also has analytical limitations. Our data are cross-sectional, so we do not analyze differences in effects at different times. Future studies can use time-series data to analyze the time-lag effect of embeddedness as well.

Drawing on our findings, we suggest several potential future research avenues. First, further examination of the role of search breadth can reveal stimulating findings. Either investigating its role in other, more diverse context or through longitudinal research can yield findings that confirm or disconfirm ours. Second, it might be interesting to expand the model further and include elements that account for the role of MNE subsidiaries' external networks.

Although the sheer size and geographic scope of MNEs mean rich internal network, further exploration of external network dynamics in relation to knowledge transfer and external search activities can offer complementary insights. Third, in line with the strategic approach to innovation, investigating how MNE subsidiaries leverage their innovation performance toward various strategic ends such as a charter change in their parent firm or legitimacy in their host countries. Innovations' utility can extend beyond financial ends, and it would be interesting to explore what other consequences MNE subsidiaries' innovation performance leads to.

Fourth, a longitudinal view of the role of embeddedness and external search in innovation performance could be a fruitful research avenue as such approach can capture the real-time effects of network effects and better control for factors such as the potential influence of prior performance. Fifth, future research can explore different types of knowledge codifications of transferred knowledge as such studies are currently lacking in the extant literature. Finally, as subsidiaries are embedded in MNEs and MNEs are embedded in their macro (e.g., institutions or larger networks) contexts, we suggest a multilevel research to test whether different sources and enablers of innovation performance at the aggregate or dissected levels mirror those at higher or lower hierarchical levels (cf. Felix et al., 2018). In particular, network effects can be manifested across multiple levels of analysis and future research should dig deeper into the holistic explanation of these effects that are nested throughout multiple levels.

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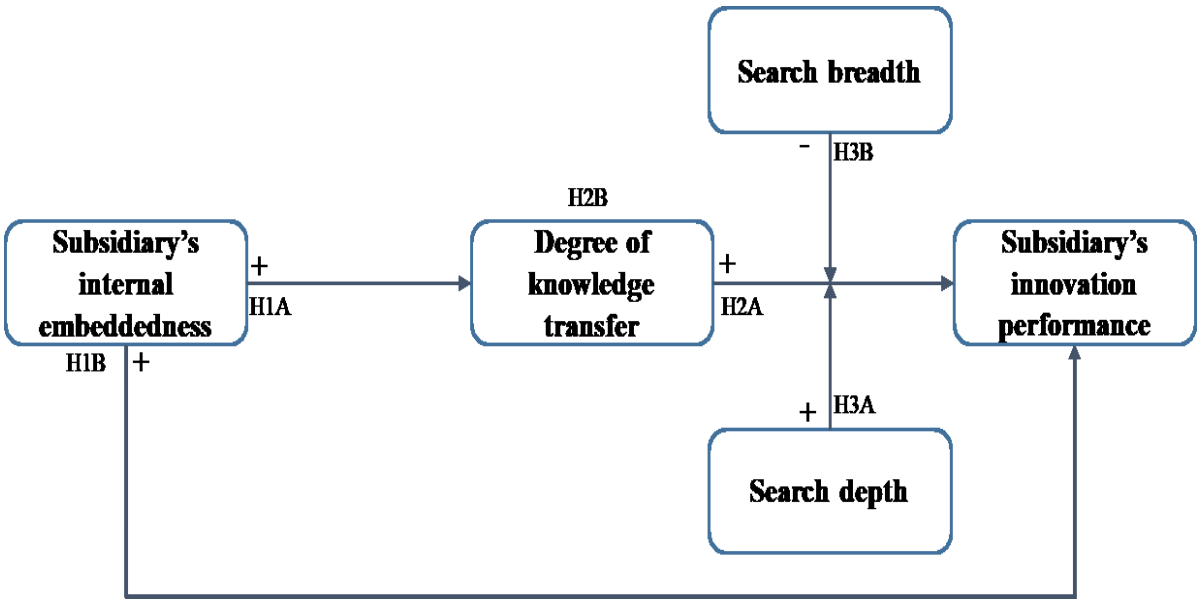

Fig. 1. Conceptual Framework

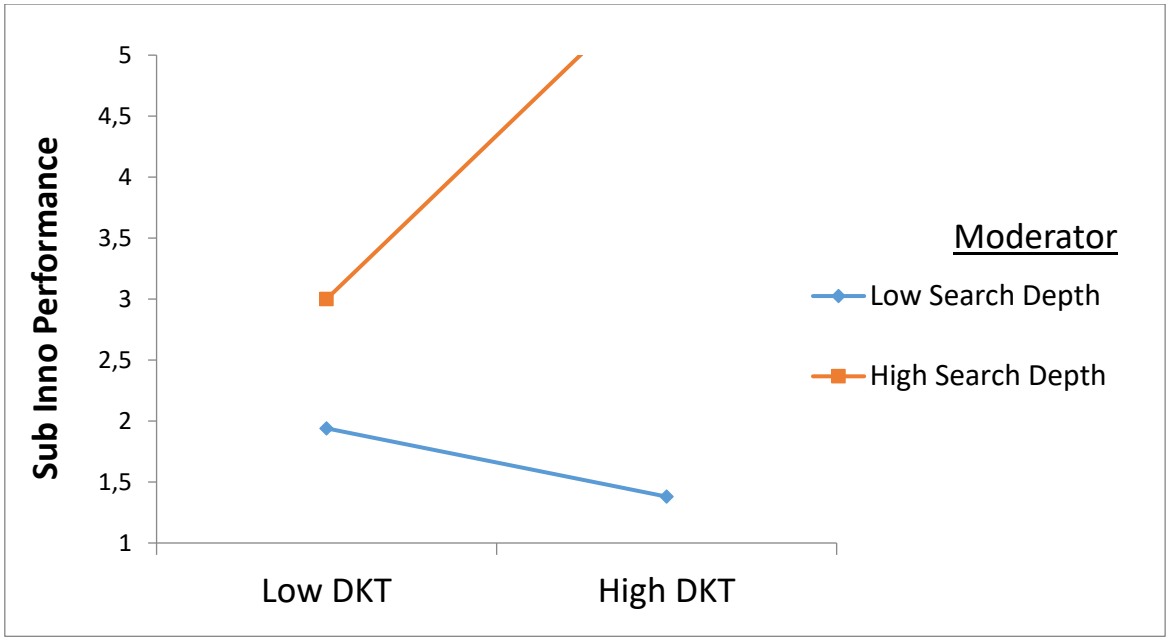

Fig. 2. Moderator effect of search depth

Table 1. Correlations, means and standard deviations of study variables

	Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
1.	Internal Embeddedness	2.81	.78	(.72)									
2.	Knowledge Transfer	3.14	1.11	.58***	(.76)								
3.	Sub Innovation Performance	5.04	1.03	.52***	.63***	(.84)							
4.	Search depth	1.56	1.04	.54***	.73***	.68***	(.78)						
5.	Search breadth	2.12	.79	.23**	.22**	.34**	.31**	(.79)					
6.	Age	0.33	0.11	.19*	.16*	.21*	.16*	.01	(.81)				
7.	Size	0.12	0.08	.22^{+}	.29*	.11*	.04*	.08	.33**	(.84)			
8.	Type of innovation (1=product)	0.43		-.03	.02	.19*	.21^{+}	.03	-.08	.24^{+}	(.88)		
9.	Entry mode (1=joint venture)	0.62		-.06	.06	-.11	-.09	.02	-.06	-.07	-.01	(.77)	
10.	R&D intensity	0.44	0.14	.31*	.21**	.25**	.11	.09	.03	.09	.04	.07	(.80)
11.	Industry (1=KIBS)	.48		.01	.08*	.11**	.11*	.06*	-.09	-.03	-.13*	.04*	.09*

N=91 observations; +p<.10; *p<.05; **p<.01; ***p<.001; Two-tailed tests. The Cronbach's alpha is displayed on the diagonal.

Table 2. Hierarchical regression models for testing mediation and moderation effects

(1)Subsidiary's innovation performance		**B**	**SE**	**t**	**p**
Controls					
	Age	.04	.23	2.06	**.044**
	Size	.06	.12	–.70	.487
	Type of innovation (1=product)	.30	.30	1.85	.067
	Entry mode (1=joint venture)	-.00	.22	-1.03	.218
	R&D intensity	.26	.28	2.08	**.006**
	Industry (1=KIBS)	.08	.11	2.04	**.049**
	Search Depth	1.76	.30	5.89	**.000**
	Search Breadth	.43	.26	1.67	.098
Total R2=.72* **	**Adjusted R^2=.50**				
	Internal embeddedness (Hypothesis 1b)	.74	.31	2.35	**.021**
(2) Knowledge transfer		**B**	**SE**	**t**	**P**
Controls					
	Age	.29	.14	2.04	**.043**
	Size	.00	.01	.09	.932
	Type of innovation (1=product)	.16	.13	1.99	**.046**
	Entry mode (1=joint venture)	.04	.04	.66	.421
	R&D intensity	.21	.09	2.75	**.007**
	Industry (1=KIBS)	.04	.19	.03	.128
	Search Depth	.78	.11	7.00	**.000**
	Search Breadth	-.43	.10	-.38	.706
Total R2=.76* **	**Adjusted R^2=.57**				
	Internal embeddedness (Hypothesis 1a)	.40	.12	3.48	**.001**
(3) Subsidiary's innovation performance		**B**	**SE**	**t**	**P**
Controls					
	Age	.04	.23	2.06	**.044**
	Size	.06	.12	–.70	.487
	Type of innovation (1=product)	.30	.30	1.85	.067
	Entry mode (1=joint venture)	-.00	.22	-1.03	.218
	R&D intensity	.26	.28	2.08	**.006**
	Industry (1=KIBS)	.08	.11	2.04	**.049**
	Search Depth	1.34	.37	3.66	**.000**
	Search Breadth	.45	.26	1.77	.080
	Internal embeddedness	.52	.33	1.57	.119
Mediators DR^2=.05*	**Total R2=.54*** ** **Adjusted Total R^2=.52**				
	Knowledge transfer (Hypothesis 2)	.53	.28	2.05	**.048**
(4) Subsidiary's innovation performance		**B**	**SE**	**t**	**p**
Controls					
	Age	.18	.21	2.01	**.040**
	Size	.02	.19	–.70	.487
	Type of innovation (1=product)	.11	.31	1.85	.067
	Entry mode (1=joint venture)	-.00	.22	-1.03	.218

	R&D intensity		.20	.12	2.05	**.043**
	Industry (1=KIBS)		.04	.14	1.62	.088
	Search Depth		-1.41	1.01	-1.39	.168
	Search Breadth		-.087	.91	-.096	.924
	Knowledge transfer		-1.08	.65	-1.67	.097
	Internal embeddedness		.65	.32	2.03	**.049**
Moderators DR^2=.04* **	**Total R2=.54*** **	**Adjusted Total R^2=.52**				
	Knowledge transfer x Search Depth (Hypothesis 3a)		.81	.28	2.84	**.004**
	Knowledge transfer x Search Breadth (Hypothesis 3b)		.13	.25	.50	.62

N=91; *p<.05; **p<.01; ***p<.001

Table 3. Conditional effects of external search depth and breadth

Breadth	Depth	Effect	SE	t	p	LLCI	ULCI
1,0000	1,0000	-,1548	,3654	-,4236	,6730	-,8814	,5719
1,0000	2,0000	,6500	,3295	1,9729	,0518	-,0052	1,3052
1,0000	3,0000	**1,4548**	,4942	2,9435	,0042	,4720	2,4376
2,0000	1,0000	-,0290	,3668	-,0791	,9372	-,7585	,7005
2,0000	2,0000	**,7758**	,2922	2,6550	,0095	,1947	1,3568
2,0000	3,0000	**1,5806**	,4437	3,5623	,0006	,6982	2,4629
3,0000	1,0000	-,0290	,3668	-,0791	,9372	-,7585	,7005
3,0000	2,0000	**,7758**	,2922	2,6550	,0095	,1947	1,3568
3,0000	3,0000	**1,5806**	,4437	3,5623	,0006	,6982	2,4629